CLAIMS:

1. A converter circuit comprising:

- at least a first switching element (T_1) and a second switching element (T_2) and an inductive element (L),
- wherein a control device (26) is provided to alternately switch the switching elements (T_1, T_2) so that a current (I_L) flows through the inductive element (L),
- and wherein at least at the second switching element (T_2) there is provided a freewheeling diode (D_2) which is capable of conducting the current flowing through the inductive element (L) after turn-off of the first switching element (T_1),
- wherein the control device (26) controls the timing of driving the switching elements (T_1, T_2) upon switching from the second switching element (T_2) to the first switching element (T_1) by determining whether a shoot through current occurs or the freewheeling diode (D_2) is conducting,
- wherein, in the case of a shoot through current, the drive is changed such that the turn on of the first switching element (T_1) takes place later with respect to the instant of turn off of the second switching element (T_2),
- and, if the freewheeling diode (D_2) is conducting, the drive is changed such that the turn on of the first switching element (T_1) takes place sooner with respect to the instant of turn off of the second switching element (T_2).

2. A converter circuit as claimed in claim 1, wherein

- the switching elements (T_1, T_2) are driven such that they are simultaneously conducting during a period of overlap ($\Delta t_{overlap}$),
- and wherein the control device (26) controls the duration of the period of overlap ($\Delta t_{overlap}$) in that it is determined whether a shoot through current occurs or the freewheeling diode (D_2) is conducting,
- wherein, in the case of a shoot through current, the duration of the period of overlap is reduced,
- and, if the freewheeling diode (D_2) is conducting, the duration of the period of overlap is increased.

3. A converter circuit as claimed in any one of the preceding claims, wherein
- the control device (26) comprises means for measuring the voltage (V_{T2}) across the second switching element (T_2), the voltage (V_{T2}) being observed at least after turn-off of the second switching element (T_2),
- and it is determined, by means of the voltage variation, whether a shoot through current occurs or the freewheeling diode (D_2) is conducting.

4. A converter circuit as claimed in claim 3, wherein
- the second switching element (T_2) is a MOSFET in a housing,
- wherein at least connecting lines for the drain, the source and the gate are led from the housing to the exterior,
- wherein one or more additional measuring lines are provided for determining the voltage (V_{T2}) between the drain and the source.

5. A converter circuit as claimed in claim 3 or 4, wherein
- the peak value ($\hat{V}_{T2}$) is determined of the oscillating voltage obtained after turn-off of the second switching element (T_2),
- and the timing of the drive of the switching elements (T_1, T_2) is set such that said peak value ($\hat{V}_{T2}$) is minimized.

6. A converter circuit as claimed in claim 3 or 4, wherein
- a minimum of the voltage (V_{T2}) across the second switching element (T_2) is determined,
- and the timing of driving the switching elements (T_1, T_2) is set such that the value of the minimum lies between the forward voltage of the second switching element (T_2) and the forward voltage of the freewheeling diode (D_2).

7. A converter circuit as claimed in any one of the preceding claims, wherein
- the control device comprises means for measuring at least one electrical quantity (V_{T2}) of the converter circuit (12),
- in the course of at least a first switching period (T) at least one measurement is carried out,

- and said measurement is used to set the timing of driving the switching elements (T_1, T_2) in a second switching period.

8. A converter circuit as claimed in any one of the preceding claims, wherein
- at the onset of operation, upon switching from the second to the first switching element, a dead time is provided between the turn off of the second switching element (T_2) and the turn on of the first switching element (T_1).

9. A converter circuit as claimed in any one of the preceding claims, wherein
- upon switching from the second switching element (T_2) to the first switching element (T_1)
- the first switching element (T_1) is driven in such a way, for a protection period that lasts at least until the turn-off of the second switching element (T_2), that the current through the first switching element (T_1) cannot exceed a threshold value ($I_{T1,max}$),
- which threshold value ($I_{T1,max}$) lies above the nominal output current of the converter circuit.

10. A drive device for a converter circuit as claimed in any one of the preceding claims, comprising:
- a device for alternately driving at least a first switching element (T_1) and a second switching element (T_2)
- and a device for determining whether a shoot through current occurs or a freewheeling diode (T_2) is conducting,
- the timing of driving the switching elements (T_1, T_2) upon switching from the second switching element (T_2) to the first switching element (T_1) being controlled such that in the event of a shoot through current the drive is changed such that the turn on of the first switching element (T_1) takes place later with respect to the instant of turn off of the second switching element (T_2), and if the freewheeling diode (D_2) is conducting, the drive is changed such that the turn on of the first switching element (T_1) takes place sooner with respect to the instant of turn off of the second switching element (T_2).

11. A drive method for a converter switch comprising at least one half bridge (12) with a first and a second switching element (T_1, T_2), in which at least at the second switching element (T_2) a freewheeling diode (D_2) is provided, wherein

- the timing of switching of the switching elements (T_1, T_2) upon switching from the second switching element (T_2) to the first switching element (T_1) is controlled,
- wherein it is determined whether the freewheeling diode (D_2) is conducting or a shoot through current occurs,
- wherein, in the event of a shoot through current, the turn on of the first switching element (T_1) takes place later with respect to the instant of turn off of the second switching element (T_2),
- and, if the freewheeling diode (D_2) is conducting, the turn on of the first switching element (T_1) takes place sooner with respect to the instant of turn off of the second switching element (T_2).